

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE



In re Application of: )  
Edwin James DuMorris Eddy et al ) Examiner Clark F Dexter  
)  
Serial No 09/380,351 )  
) Group Art Unit 3724  
Filed: August 31, 1999 )  
)  
For: LONGITUDINAL COLD )  
SEPARATION DEVICE ) Attorney Docket P-6374.03 CPA

---

Assistant Commissioner for Patents  
Washington, D.C. 20231

DECLARATION OF SHAY VINCENT EDDY

Honorable Sir:

RECEIVED

APR 16 2004

I, Shay Vincent Eddy, declare and state that: TECHNOLOGY CENTER R3700

1. I am one of the named inventors in the above-mentioned patent application.
2. I am a director of EDMET INTERNATIONAL LIMITED, the assignee of the invention and the above-mentioned patent application, and corresponding patents and patent applications in other countries.
3. I am a director of STEEL CENTRE 4 Limited of Midland Road, Midland Road Industrial Estate, Scunthorpe, North Lincolnshire, DN16 1DQ a sister company of EDMET INTERNATIONAL LIMITED and a licensee under the above-mentioned patent application, and corresponding patents and patent applications in other countries.
4. One main area of business for STEEL CENTRE 4 Limited during the last 21 years has been in the separation and straightening of elongate metallic members, such as I beams, U sections etc. (the operation of separating elongate metallic members along a longitudinal axis is referred to in the trade as "beam splitting").

..... am generally familiar with the various metal cutting techniques used in beam splitting.

5. I have read and understand US Patent No 4,452,118 ("the Muller reference"), the Office Action October 7, 2003 in which the Muller reference is cited, and my CPA with preliminary amendment filed on December 28, 2001.
6. In paragraph 4 of page 3 of the Office Action the Examiner argues that it would be obvious to one skilled in the art to add the first and third workpiece supports to the Muller device to arrive at the cold separation device of the invention.

The Examiner also argues that it would be obvious to one skilled in the art to use the device described in Muller to cut an elongate metallic member to longitudinally split the member into two pieces.

### Background

7. Elongate metallic members such as I beams, U sections etc have for many years been split longitudinally. The reason for splitting such beams is that in a steel mill, given the comparative size of the markets for I beams and T beams, it is more cost effective to roll an I beam and then split it longitudinally to generate two T beams than it is to roll two T beams.
8. As set out in the specification of the above-mentioned patent application, there were problems with the splitting techniques of the art prior to our invention, the subject of the above-mentioned patent application. The problems were of quality and price. The hot beam splitting techniques using oxy-propane or oxy-acetylene torches, or plasma guns distorted the steel and left a low standard of edge finish that required milling to establish an edge that could be welded to. Architects and Civil Engineers were specifying box section steel in place of T beams. Box section steel is produced by rolling plate and welding along one edge and is not subject to the problems associated with the afore-mentioned beam splitting techniques. However, box section does not provide the flexibility in construction afforded by a T-beam, in the horizontal portion of the T provides surfaces to

which other constructional members can be attached within the overall height of the T-beam. It is also twice as expensive at about \$1800.00 per tonne of steel.

9. In my opinion the claimed invention was not obvious in view of Muller, and that the Commercial Success of the claimed invention demonstrates this.

### **Commercial Success**

10. The market for split beams was falling prior to 1996 and as can be seen from the table below, by 1996 the revenue generated by Steel Centre 4 in respect of its beam splitting service was £40,000 (\$72,800) per year, which equated to splitting longitudinally about 533 metric tonnes of steel piece. The information shown in the table below is taken from the company accounting records for Steel Centre 4 Limited.

Year	Revenue from Beam Splitting Service in US\$	Mass cut in metric tonnes
1996	72800	533
1997	145600	1066
1998	172900	1266
1999	218400	1600
2000	254800	1866
2001	327600	2400
2002	382200	2800
2003	209300	1533
2004	273000	2000

The figures in the table show a steady year on year rise in revenue to Steel Centre 4 from selling the service of longitudinally splitting metallic pieces from the year of introduction of the machine of the invention in 1997 to 2002. Sales fell in 2003 due to the world slump in demand for steel and picked up again in 2004, again as the overall demand for steel rose again.

In my opinion the apparatus and process of the claimed invention was not obvious in that, notwithstanding the great need for splitting I-beams and other shaped sections longitudinally during the period preceding 1997 (for example into T-beams for use in construction where box section steel at \$1800 / tonne was being used rather than T-beams at about \$900 / tonne) the use of saws of the type described in Muller (published June 5, 1984, thirteen years prior to the date of the invention) to separate an elongate metallic members longitudinally along their lengths was not known. Notwithstanding the great need for elongate split pieces free from distortion and damage, no beam splitting techniques using cold cutting were known. It was not until the inventors of this invention produced their successful apparatus and process that the architects and civil engineers once again started to specify T-beams made by splitting longitudinally an I-beam.

In my opinion, commercial success has resulted from the claimed invention in that the apparatus has characteristics not found in any competitive product known to me, and the process produces a product having characteristics not found in any other competitive product known to me. For example, in 2002 Steel Centre 4 won a \$145,000 contract from Corus plc (one of the world's largest steel makers) to split I-beams into T-beams to be supplied to Murray International Metals Corp of Houston, Texas, USA. The T-beams were for use as rails for a crane and were supplied in 18.3 metre lengths. In use the T-beam would be positioned such that the free edge of the vertical part of the T faced upwards, with that free edge constituting the rail. To function as a rail it was critical that the height of the vertical part of the T was to be 430 mm to an accuracy of  $\pm 1$ mm over the 18.3 metre length of the beam.

Known beam splitting techniques rely on simply splitting a beam into two equal width pieces (and equally the Muller reference directed to wood cutting is only capable of roughly cutting a workpiece into two elements). However, for the above-mentioned application known beam splitting techniques would not provide the accuracy required. This is because an I-beam having a nominal depth of 914 mm may have an actual depth of anywhere between 905 mm and 920 mm. This variation in depth arises because during any rolling process at a steel mill the

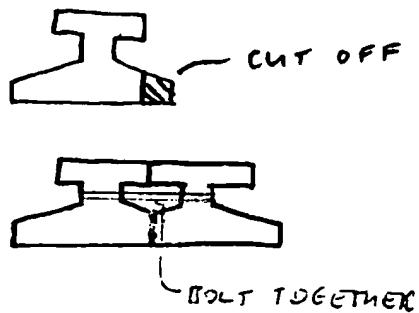
rollers wear, so the beams formed in the latter part of the run are deeper than those formed in the first part of the run.

To produce the required depth of T-beam the I-beams were put through the apparatus of the claimed invention and split longitudinally twice, to leave two T-beams each manufactured to a fine tolerance and to a finish suitable to function as a rail for a crane, and a piece of waste steel. It is the combination of features of the claimed invention that allowed the specified product to be produced and hence this order to be won. In the absence of the claimed invention, these rails would not have been formed from splitting I-beams.

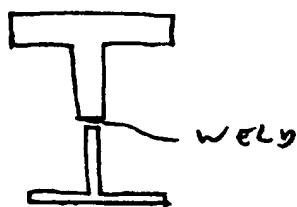
In another example, a customer had a requirement for a heavy duty rail to carry a vehicle used in the construction of the Channel Tunnel (the tunnel stretching under the English Channel between England and France). The weight of the vehicle was such that rails of the type used as railroad track, and produced as standard items by steel mills, would not carry the vehicle. The two options were:

- i) to have a special rail section rolled at a steel rolling mill, which would have required the manufacture of a bespoke set of rollers at a cost of around \$250,000, which spread over the 30 tonnes required gave a cost of \$8333.00 per tonne excluding the costs of the steel. Not only was this option costly, but resulting rail would have weighed 700kg/metre, requiring special rail support sleepers.
- ii) To attach together two standard railroad rails. Since the lower part of the rail resting on the rail support sleeper is wider than the rail element on which the wheel runs, it was necessary to remove a portion of the lower part of the rail so that the two rails could be joined together with the rail elements abutting each other. Rails are work hardened and have a high manganese content, meaning that they could not be cut with hot beam splitting techniques. The apparatus of the claimed invention was used to cut rails longitudinally along their whole lengths so that they could be joined together as shown in the sketch below. No other device could have done this. The cost of producing these rails was the cost of 30 tonnes of steel plus Steel Centre 4 Ltd's service charge of \$136.50 per

tonne for 30 tonnes of steel cut, i.e. \$4095.00. The cost over steel to our customer was \$136.50 compared to \$8333.00 using the only alternative method. The saving to our customer was massive.



In another example, the claimed invention has allowed I beams to be constructed from two T beams, each manufactured from I-beams using the apparatus of the claimed invention, the T-beams being of unequal dimension. Such constructed I beams can span greater distances than conventional I-beams. This is because the overall weight of the constructed I-beam is less than the weight of the conventional I-beam. The surface of the cut edge of the T-beams produced by the claimed apparatus and resulting from the claimed process is a sufficiently high standard to allow welding thereto with no other preparation. If other beam splitting techniques were used, the cut edge would have to be milled prior to welding.



13. All statements made herein of my own knowledge are true, and all statements made on information and belief are believed to be true;
12. These statements were made with the knowledge that wilful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such wilful false statements may jeopardise the validity of the application or any patent resulting thereon.

Shay Vincent EDDY

Shay Vincent EDDY

Date: 7-4-04